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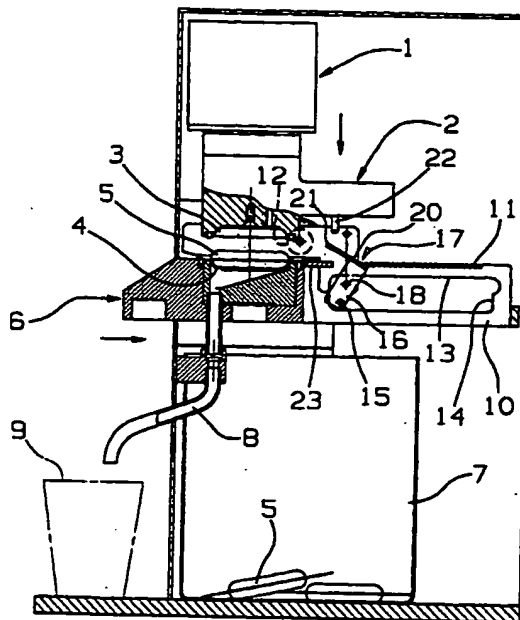
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(54) **Device for feeding precompressed single-serving pods in machines for the production of espresso coffee beverages**

(57) Device for feeding precompressed single-serving pods in machines for the production of espresso coffee beverages, comprising a retractable drawer (6) incorporating a lower pod support (4) and pod (5) retaining means (17) which are dissociated for travel purposes from said drawer (6) and activated and deactivated in phase with the retraction thereof.

FIG-1



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Description

DETAILED DESCRIPTION**Prior art**

[0001] - In machines for the production of espresso coffee beverages, it is known to use "pods" for the feeding thereof, said pods comprising precompressed single servings of ground coffee enclosed in filter paper and subsequently packed in strips for the feeding of the automatic devices, or separately, and also in strips having predetermined breaking points, for manual use, the device according to the present invention falling within said field of manual use of said pods.

Objects of the invention

[0002] - The principal object of the present invention is, within the technological field identified above, that of providing a manual feed device for single-serving pods, especially in the simplest and most economical machines for the production of espresso coffee beverages, such as automatically to provide for the removal of the spent pod at the end of the operating cycle, so that the manual nature of the feed is substantially confined to the positioning of the new pod.

[0003] - Another object of the present invention is that of achieving the above object by means of a device which is constructed and engineered in a particularly simple and, therefore, robust manner and which can be actuated manually or automatically, in the latter case by using the broadest possible range of known means.

[0004] - Yet another object of the present invention is that of achieving the above objects by means of a device which can be combined as easily as possible with the components forming the machines for the production of espresso coffee beverages according to the prior art.

[0005] - A further object of the present invention is that of achieving the above objects by means of a simple, functional and efficient device, reliable in operation and relatively economical in cost, having regard to the results achieved therewith in practice.

Summary of the invention

[0006] - These and other, additional objects are all achieved with the device for feeding precompressed single-serving pods in machines for the production of espresso coffee beverages according to the present invention, comprising a retractable drawer (6) incorporating a lower pod support (4) and pod (5) retaining means (17) which are dissociated for travel purposes from said drawer (6) and activated and deactivated in phase with the retraction thereof.

Brief description of the drawings

[0007] - Further features and advantages of the device according to the present invention will be more clearly apparent from the detailed description which follows of a preferred but not exclusive embodiment thereof, shown by way of example only and without limiting effect in the five attached plates of drawings, in which:

- Figure 1 shows a view in lateral section of a machine for the production of espresso coffee beverages having associated therewith the device according to the present invention in one of its operating positions;
- Figure 1 bis shows an associated detail;
- Figure 2 shows the same view as Figure 1, illustrating the device according to the present invention in another of its operating positions;
- Figure 3 shows a plan view of the device according to the present invention; and
- Figure 4 shows a detailed frontal section of said device.

Static description of the illustrative embodiment

[0008] - With reference to said figures, and in particular to Figure 1, 1 designates as a whole the upper turret of a machine for the production of espresso coffee beverages, comprising all the mechanisms, devices and pipes of a known type necessary for a vertically sliding assembly, in turn indicated as a whole by 2, functionally to move, during the pressurization stroke, an upper pod support shell 3 onto a lower pod support shell 4, between which is shown a pod 5 consisting of a precompressed, discoid single serving of ground coffee enclosed between two usually quadrilateral, but possibly differently shaped, sheets of filter paper joined to each other in a known manner.

[0009] - The lower pod support shell 4 is recessed into a pull-out drawer, indicated as a whole by 6, positioned above a collecting box 7 for spent pods 5 and connected to piping 8 for passing the prepared beverage to a consumption receptacle

- a disposable cup 9 positioned at the front.

[0010] - The drawer 6 is equipped at the rear with parallel lateral appendages or guides 10 (see also Figure 3), on the top of one of which is machined a longitudinal segment of rack 11, engaged by appropriate means of an electric motor 12.

[0011] - The parallel lateral guides 10 exhibit respective longitudinal symmetrical slots 13, distally shaped with a lower projection 14, through the aperture of which slots a pin 15 is introduced, at a level appropriate to engage with said projection 14, and connecting at the bottom the parallel levers 16 interposed therein

which actuate an assembly that may be described as a "pincer" for associated functions that are more fully explained below, indicated as a whole by 17 (see also Figure 4);

- the levers 16 have a fulcrum 18 which is fixed relative to the vertical travel of the upper pod support shell 3 and to the horizontal travel of the lower pod support shell 4 and are designed with two angles of elasticity relative to said fulcrum 18 by means of lateral springs 19;
- the levers 16 are, furthermore, paired at the top by a crossbar 20, equipped with three proximal prongs 21, and able to engage with a lower projection 22 of the sliding assembly 2 in a raised position and to fall back onto a fixed bracket 23 in the same plane as the lower pod support shell 4 for the functions which will now be specified below.

Dynamic description of the illustrative embodiment

[0012] - The static description of a preferred example of embodiment of the device according to the present invention having thus been completed, the dynamic or functional description will now be given below:

- by means of a command given in any known manner by the user, the drawer 6 moves out forward as a result of the action of the motor 12 on the rack 11 to the end of the retraction travel (see Figure 2);
- in this position, a pod 5, to be taken for this purpose from any dispenser thereof of a known type, is placed by the user on the lower pod support shell 4, whereupon the drawer 6 may be caused to move under a stimulus to be provided by said user.

[0013] - At this point the espresso coffee beverage production cycle as such may take place: this requires the downward movement, actuated automatically or manually in a known manner, of the sliding assembly 2 and subsequently the pressurization stroke of the upper pod support shell 3 onto the lower pod support shell 4, trapping the pod 5 between them, by means of which, again in a known manner, a flow of heated water is brought to sufficient pressure to permeate the pod and, becoming charged with coffee essence, falls into the consumption container 9 via the piping 8.

[0014] - In its downward movement, the sliding assembly 2 engages with the crossbar 20 of the pincer 17, moving the levers 16 across the fulcrum 18 to the other angle of elasticity, thus trapping, by means of the prongs 21 against the stop provided by the bracket 23, the double-layered margin of filter paper, however it may be shaped, which surrounds the discoid form of the pod 5, the margin having arrived at this point as a result of the insertion of the drawer 6 (see Figure 1).

[0015] - On completion of the beverage production

phase, the sliding assembly 2 is raised and the pod 5 remains positioned on the lower pod support shell 4, remaining engaged by the pincer 17 until the next movement to open the drawer 6 for a new production cycle:

- when the drawer 6 is again displaced, in the manner already referred to at the outset of the dynamic description, the spent pod 5 remains trapped by the pincer 17 and, when the support supplied by the lower pod support shell 4 is completely removed from it, it is forced to hang down into the space created there (see Figure 2).

[0016] - On completion of the retraction travel of the drawer 6, the slots 13 of the parallel lateral guides 10 behind the drawer reach the end of their own aperture, striking with the tooth 14 against the lower linking pin 15 of the levers 16, moving them across the fulcrum 18 to the other angle of elasticity, thus opening the pincer 17, whose fulcrum 18 finds space in the wider portion of the slots 13 above the tooth 14, i.e. releasing from the prongs 21, on the stop provided by the bracket 22, the margin of filter paper of the spent pod 5, which thus falls into the collecting box 7 for spent pods 5, leaving the track free for the drawer 6 to return for a new production cycle.

Alternative embodiments

[0017] - It is clear that, in further alternative embodiments, provided that they fall within the concept of a solution on which the illustrative embodiment described above and claimed below is based, the device according to the present invention can be embodied by equivalent technical and mechanical means, or supplied with further supplementary arrangements, and that all the designs of the various components can be varied suitably for the purpose, samples of which will be given below, purely by way of example and without implying any limitation:

- the automatic drawer travel means may alternatively be designed and/or positioned in any desired different manner appropriate to the purpose;
- the drawer may also easily be adapted for manual operation by means of simple application of gripping means to the front thereof and, preferably, of arrangements such as to require the user to carry out the entire retraction travel;
- the rear lateral guides may alternatively be replaced by any desired device of a shape such as to engage the pincer opening means at the end of the retraction travel of the drawer;
- the closure of the pincer, instead of being provided by the downward movement of the upper sliding assembly, as described and illustrated in the preferred example of an embodiment, may also be alternatively actuated by said rear lateral guides,

appropriately designed for the purpose and with a slot which is shaped proximally in a manner that is a mirror image of the similar distal shaping seen above;

- decisively and fundamentally regarding the solution concept and the scope of the claims: both the closure and the opening of the pincer may alternatively be actuated by the agency of any desired means of any nature, appropriately timed, provided that it is suitable for the purpose.

LIST OF REFERENCES

[0018]

- | | | |
|----|--|----|
| 1 | Upper turret as a whole | |
| 2 | Sliding assembly as a whole | |
| 3 | Upper pod carrier shell | |
| 4 | Lower pod carrier shell | |
| 5 | Pod | 5 |
| 6 | Drawer as a whole | |
| 7 | Spent pod collecting box | |
| 8 | Finished coffee delivery piping | |
| 9 | Consumption receptacle - disposable cup | |
| 10 | Rear parallel lateral appendages or guides of the drawer 6 | 25 |
| 11 | Rack | |
| 12 | Electric motor | |
| 13 | Slots of the parallel lateral guides 10 | |
| 14 | Lower projection of the slots 13 | 30 |
| 15 | Lower coupling pin of the levers 16 | |
| 16 | Levers of the pincer 17 | |
| 17 | Pincer as a whole | |
| 18 | Associated fulcrum | |
| 19 | Lateral springs | 35 |
| 20 | Crossbar pairing the levers 16 at the top | |
| 21 | Associated three prongs | |
| 22 | Projection below sliding assembly 2 for closing pincer 17 | |
| 23 | Fixed bracket in same plane as lower pod carrier shell 4 | 40 |

Claims

- | | | |
|----|---|----------|
| 1. | A device for feeding precompressed single-serving pods in machines for the production of espresso coffee beverages, comprising a retractable drawer (6) incorporating a lower pod support (4) and pod (5) retaining means (17) which are dissociated for travel purposes from said drawer (6) and activated and deactivated in phase with the retraction thereof. | 45
50 |
| 2. | The device as claimed in the preceding claim, wherein said retaining means (17) are actuated to retain said pod (5) for a phase which begins at any stage subsequent to the completion of the closure of said drawer (6) and in any case extends almost until the end of the opening of said drawer (6). | 55 |

3. The device as claimed in claim 1, comprising a drawer (6) incorporating a lower pod support (4) equipped with means (10) adapted to deactivate, in the retraction phase, pod (5) retaining means (17) actuated by the pressurization stroke of the upper pod support (3).

4. The device as claimed in claim 1, comprising a drawer (6) incorporating a lower pod support shell (4) equipped with a rear appendage (10) adapted to engage, in the retraction phase, the opening means (15-16) of a pincer (17) having two angles of elasticity for the retention of a pod (5) clamped by the pressurization stroke of the upper pod support shell (3).

5. The device as claimed in claim 1, comprising:

- a sliding assembly (2) incorporating an upper pod support shell (3) moved during the pressurization stroke onto a lower pod support shell (4);
- a drawer (6) equipped with at least one guide (10) provided with a distally shaped longitudinal slot (13) having a lower projection (14);
- actuating means (15) introducing themselves into said slot (13) of at least one lever (16) having two angles of elasticity and equipped with means (20-21) adapted to interfere with said sliding assembly (2) in a raised position and to fall back onto fixed stop means (23) in the same plane as said lower pod support shell (4).

6. The device as claimed in claim 1, comprising:

- a sliding assembly (2) incorporating an upper pod support shell (3) moved during the pressurization stroke onto a lower pod support shell (4);
- a drawer (6) equipped at the rear with two parallel guides (10) provided with respective longitudinal slots (13) distally shaped with respective lower projections (14);
- lower coupling means (15) introducing themselves into said slots (13) of two parallel levers (16) having two angles of elasticity and paired at the top by a crossbar (20) adapted to interfere with said sliding assembly (2) in a raised position and to fall back on fixed stop means (23) in the same plane as said lower pod support shell (4).

7. The device as claimed in claims 1 and 6, wherein said levers (16) have a fulcrum (18) which is fixed relative to the vertical travel of said upper pod support shell (3) and to the horizontal travel of said lower pod support shell (4).

8. The device as claimed in claims 1 and 6, wherein said levers (16) are designed to have two angles of elasticity relative to said fulcrum (18) by means of lateral springs (19).
9. The device as claimed in claims 1 and 6, wherein said levers (16) are paired at the top by a crossbar (20) provided with prongs (21) and adapted to interfere with said sliding assembly (2) in a raised position and to fall back on a fixed bracket (23) in the same plane as said lower pod support shell (4).
10. The device as claimed in claims 1 and 6, wherein said lower pod support shell (4) recessed in said drawer (6) is positioned above a collecting box (7) for spent pods (5) and is connected to piping (8) for passing the prepared beverage to a consumption receptacle (9).
11. The device as claimed in claims 1 and 6, wherein a longitudinal segment of a rack (11) engaged by an electric motor (12) is machined on the top of one of said guides (10).
12. The device as claimed in the preceding claims, wherein the automatic travel means of said drawer (6) are designed and/or constructed and/or positioned in any manner suitable for the purpose.
13. The device as claimed in the preceding claims, wherein said drawer (6) is designed to be manually operated by gripping means on its front and arrangements adapted to require the user to complete the entire associated retraction travel.
14. The device as claimed in the preceding claims, wherein said rear lateral guides (10) are alternatively constituted by any desired shaped mechanism adapted to engage the means for opening said pincer (17) at the end of the retraction travel of said drawer (6).
15. The device as claimed in the preceding claims, wherein the closure of said pincer (17) is also actuated by said rear lateral guides (10), provided for the purpose with a slot that is shaped proximally in a manner that is the mirror image of the associated distal shaping.
16. The device as claimed in the preceding claims, wherein the closing of said pincer (17) is actuated by the agency of any means of any kind suitable for the purpose.
17. The device as claimed in the preceding claims, wherein the opening of said pincer (17) is actuated by the agency of any means of any kind suitable for the purpose.

FIG-1

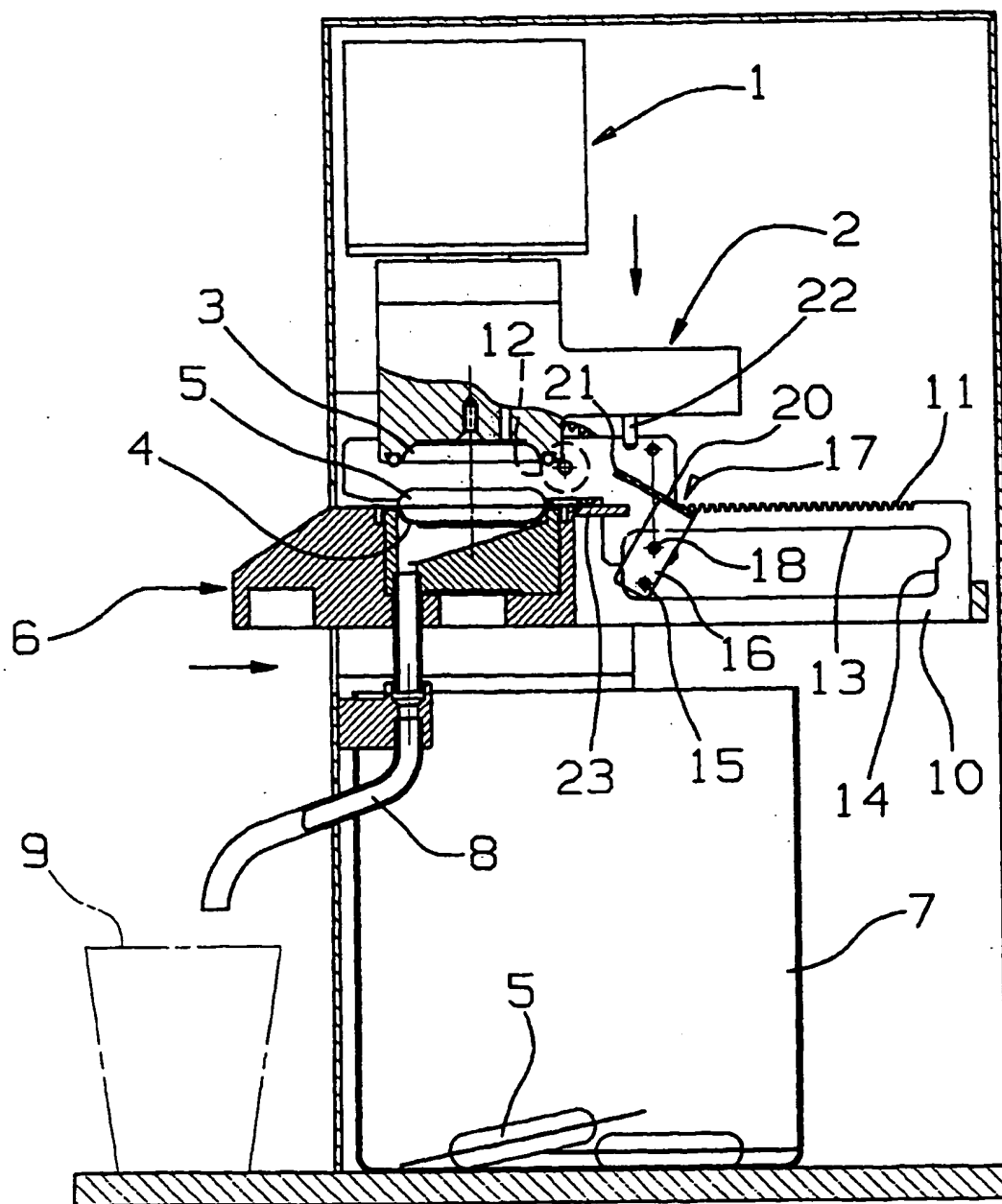


FIG-1BIS

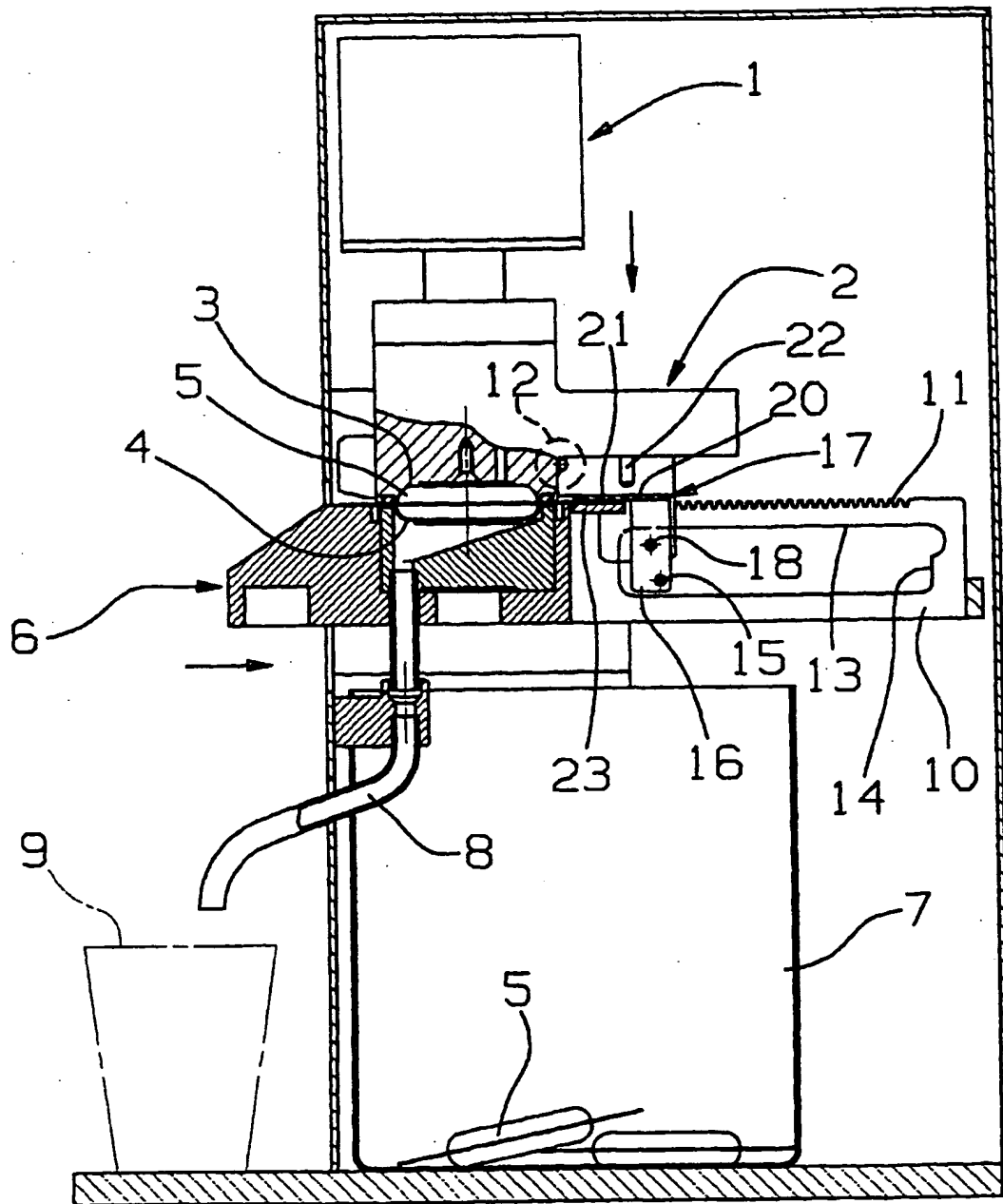


FIG-2

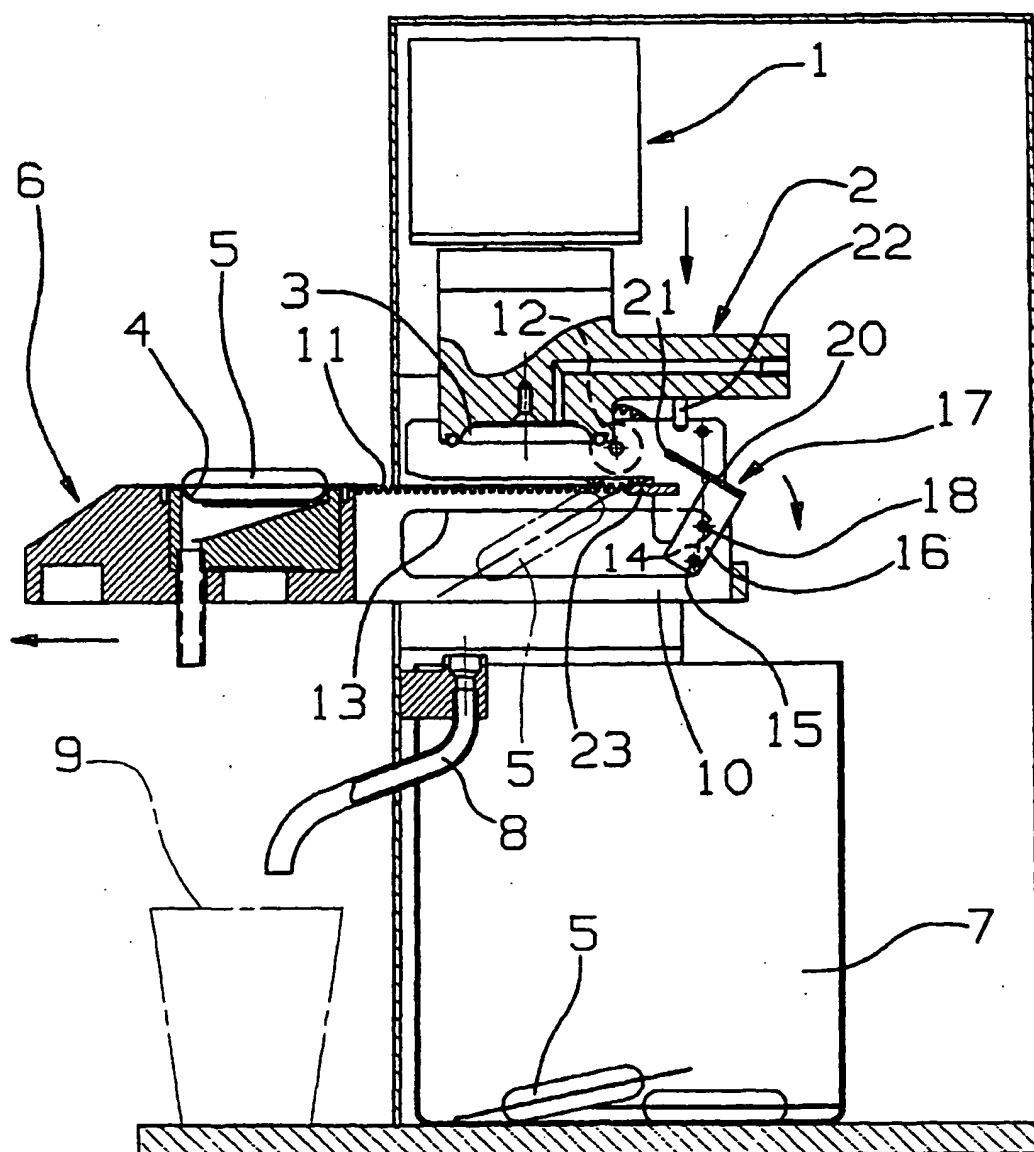


FIG-3

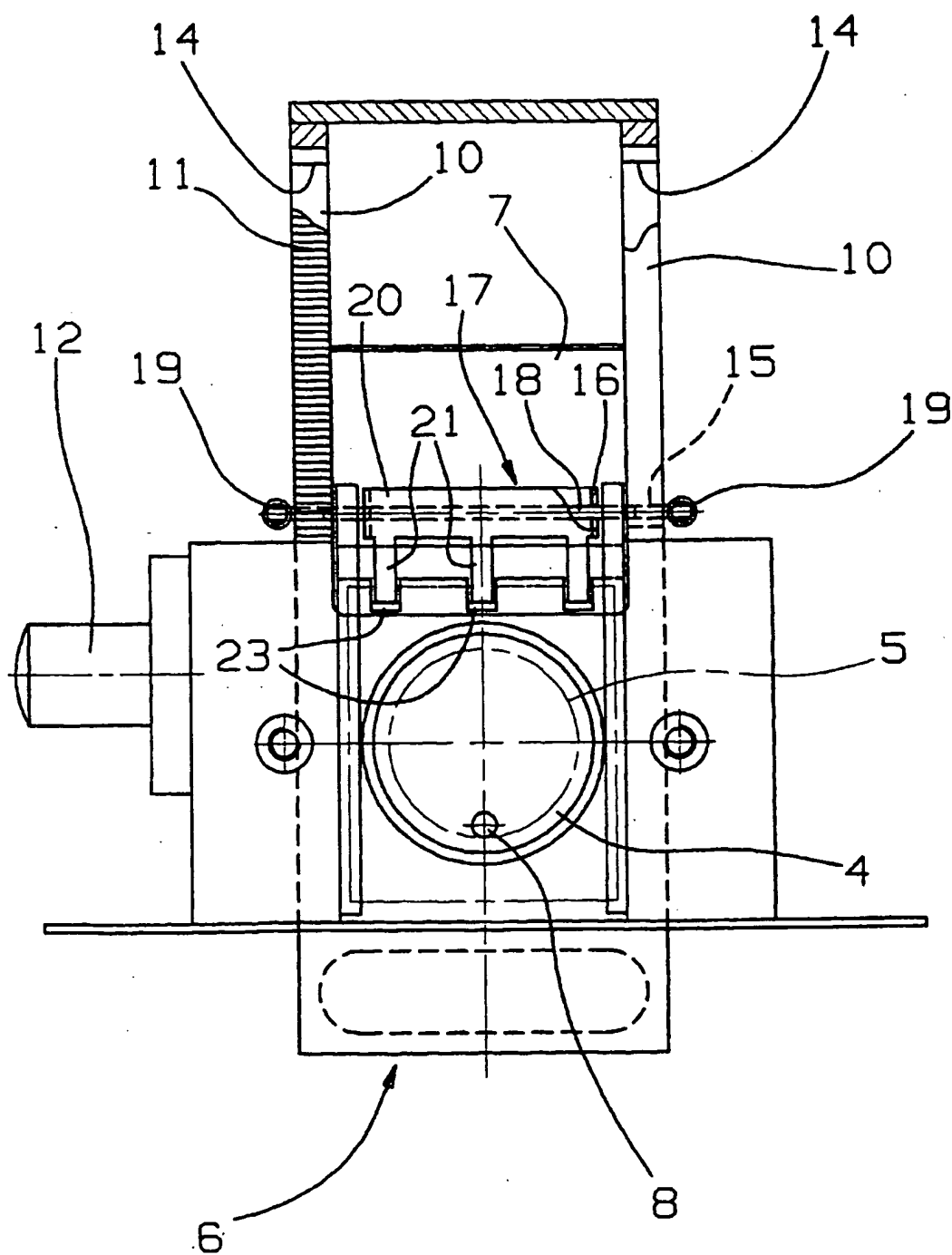
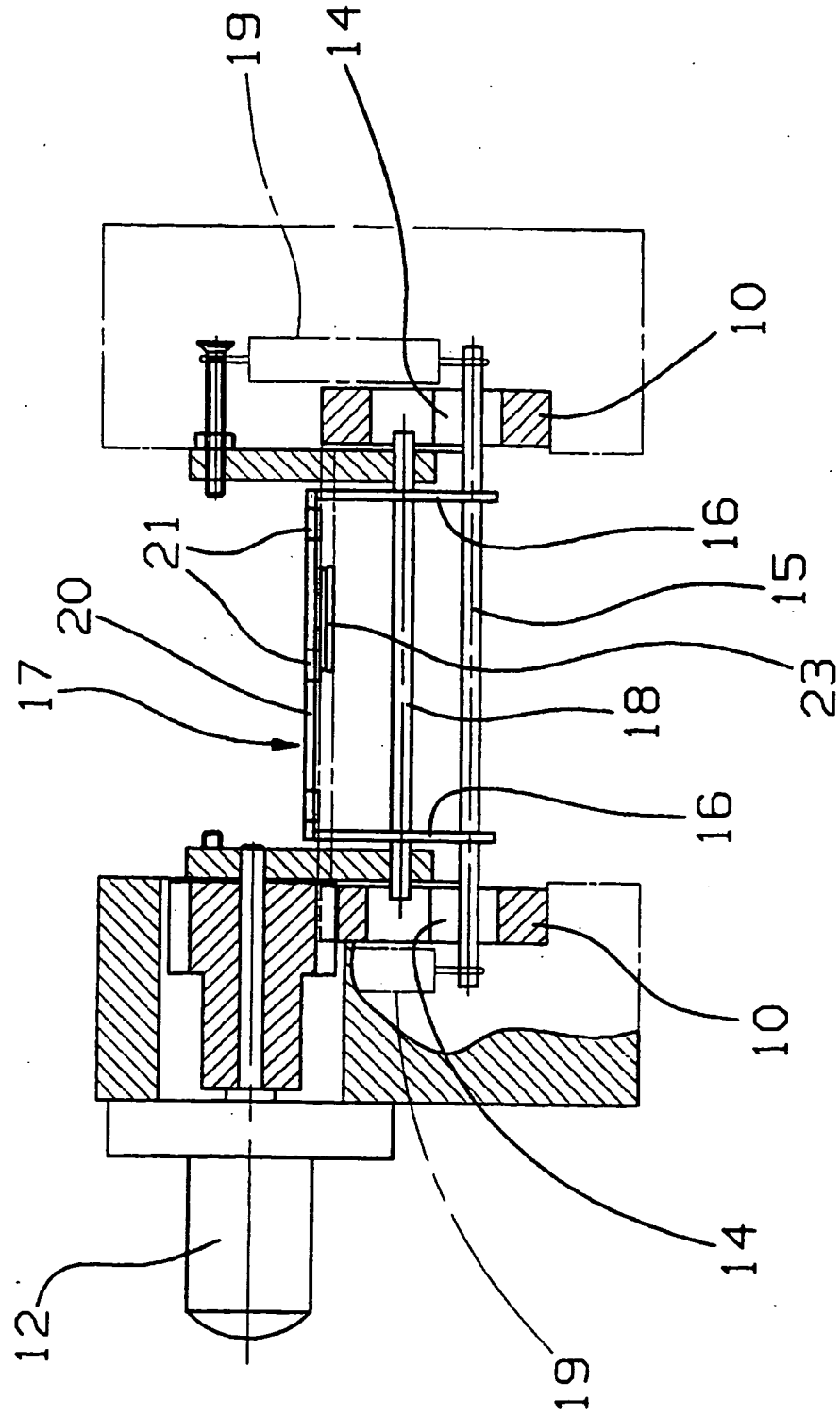


FIG-4





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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 8922

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IntCL7)
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A	PATENT ABSTRACTS OF JAPAN vol. 015, no. 324 (C-0859), 19 August 1991 (1991-08-19) & JP 03 123516 A (LUCKY CAFE MACH KK;OTHERS: 01), 27 May 1991 (1991-05-27) * abstract *	1	
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			TECHNICAL FIELDS SEARCHED (IntCL7)
			A47J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 6 September 2000	Examiner Amaro, H
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (Pdc/01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 10 8922

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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